# Presentation of Garcin Syndrome due to Lung Cancer

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**Abstract:** Garcin syndrome consists of unilateral palsies of almost all cranial nerves without either sensory or motor long-tract disturbances and without intracranial hypertension, and it is caused by a malignant osteoclastic lesion at the skull base. A 60-year-old woman presented with dizziness and left facial palsy. Progressive left cranial nerve palsies developed over 2 months until gadolinium-enhanced magnetic resonance imaging of the brain revealed an intracranial extension of a tumor from the left skull base. A systemic survey revealed adenocarcinoma of the lung, which had metastasized along the skull base. We experienced a rare case of Garcin syndrome due to skull base metastases from lung cancer.

**Key Words:** Garcin syndrome, Lung cancer, Metastasis, Skull base, Magnetic resonance imaging.

(*J Thorac Oncol.* 2007;2: 877–878)

Garcin syndrome is characterized by (1) the presence of unilateral palsies of the cranial nerves, (2) no sensory or motor long tract disturbance; (3) no intracranial hypertension; and (4) an osteoclastic lesion in the skull base.[1] Patients reported to have Garcin syndrome do not always have unilateral palsies of all cranial nerves; thus, this syndrome was redefined as the presence of at least seven ipsilateral cranial nerve palsies.[2] An association with primary nasopharyngeal tumors and a variety of metastatic tumors has been reported.[2] Here, we report a rare case of Garcin syndrome that was caused by metastasis from lung cancer to the skull base.

## CASE REPORT

A 60-year-old Japanese woman presented with dizziness in September 2006. One month later, she developed left peripheral facial palsy diagnosed as Bell's palsy and was treated ineffectively with a corticosteroid. One week later, left hearing loss and speech disturbance appeared, and the patient also noticed diplopia. Plain magnetic resonance imaging (MRI) did not show any abnormality. When her left facial pain subsequently progressed in November 2006, gadolinium-enhanced MRI revealed an extra-axial enhancing lesion in the left cerebellopontine angle. She was then referred to our hospital.

Her weight had dropped from 49 to 44 kg over the previous 2 months. She had never smoked, and her Eastern Cooperative Oncology Group performance status (PS) was 3. The physical examination was normal, except for the neurologic examination. Left acoustic (VIII) and facial (VII) cranial nerve palsies occurred initially, followed by left cranial nerve palsies of the trigeminal (V), optic (II), oculomotor (III), trochlear (IV), and abducens (VI) nerves that developed progressively over 2 months. Upon admission to our hospital, she also had glossopharyngeal (XI), vagal (X), accessory (XI), and hypoglossal (XII) nerve palsies. Eleven of the 12 cranial nerves were damaged in this patient. Nevertheless, her muscle tone, power, sensation, and coordination were normal in all four extremities.

Cerebrospinal fluid examination including cytology was normal, and a complete blood cell count and blood chemistry were all within normal limits. The serum tumor markers carcinoembryonic antigen (1379.0 ng/ml; upper limit 5 ng/ml) and cytokeratin 21 (145.1 ng/ml; upper limit, 2.8 ng) were elevated.

Gadolinium-enhanced MRI of the brain showed an extra-axial enhancing tumor, which extended along the entire left skull base. The tumor invaded from the optic canal to the hypoglossal canal on horizontal and coronal images (Figure 1A and B, respectively). Computed tomography of the chest revealed an ill-defined lesion in the left lower lobe (Figure 2). A biopsy specimen obtained from the stenosis of the left lower bronchus using fiberoptic bronchoscopy demonstrated adenocarcinoma. After completion of a staging workup, the clinical stage was determined to be IV (T1N2M1), with metastases to the bones, brain, lungs, liver, adrenal glands, and kidneys.

To control her neurologic symptoms, she was given whole-brain radiation. She was subsequently treated with gefitinib; however, her disease progressed. Next, she was treated with carboplatin and paclitaxel chemotherapy. Her condition improved with tumor reduction, and she gradually gained muscle strength. Her PS improved to 1. The left

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Disclosure: The authors declare no conflict of interest.

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ISSN: 1556-0864/07/0209-0877

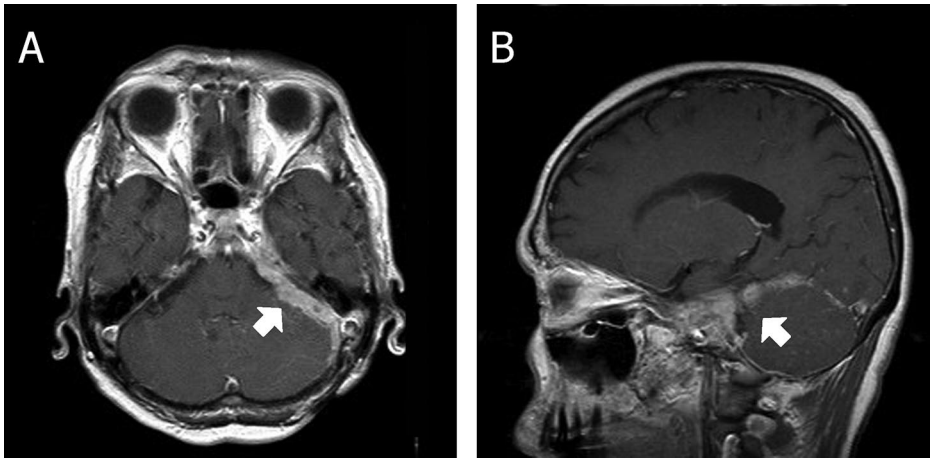


**FIGURE 1.** Gadolinium-enhanced magnetic resonance imaging of the brain revealed an extra-axial enhanced lesion near the left cerebellopontine angle. The tumor extended along the left skull base on horizontal (*A*) and coronal (*B*) images. The tumor invaded from the optic canal to the hypoglossal canal. The *arrows* indicate the tumor around the left internal acoustic foramen.

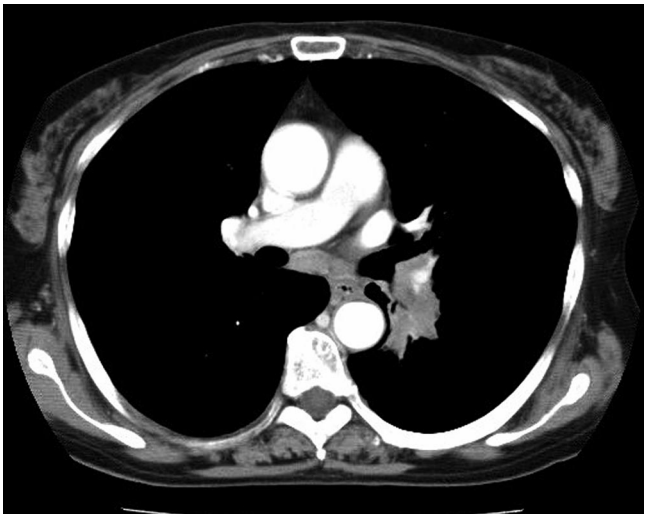

**FIGURE 2.** Computed tomography of the chest showed the presence of a tumor in the left lower lobe.

peripheral facial palsy recovered partially, although the majority of the neurologic symptoms, including the loss of sensation in the segmental areas of the trigeminal nerve, did not improve.

## DISCUSSION

We experienced a very rare case of Garcin syndrome presenting with progressive unilateral paralysis of the cranial nerves due to skull base metastasis from adenocarcinoma of the lung. To our knowledge, only one case of Garcin syndrome due to lung cancer has been previously reported (accessed via Medline on March 26, 2007).[3]

In our case, it took 2 months to obtain an accurate diagnosis of lung cancer with Garcin syndrome. Unfortunately, plain MRI of the brain did not show any abnormal findings, even retrospectively when the patient noticed diplopia. If gadolinium-enhanced MRI had been performed at that time, the tumor might have been detected earlier.

On admission to our hospital, the patient had palsies of 11 left cranial nerves, which satisfied the clinical picture of Garcin syndrome. The clinical course of this patient indicated that the metastases to the dura mater extended from the cerebellopontine angle around the internal acoustic foramen (arrows in Figure 1), and a metastatic tumor was presumed to have extended along the aspect of the left temporal lobe forward and backward.

The initial diagnosis in this case was Bell's palsy. As facial palsies and trigeminal neuralgia are frequently encountered in clinical practice, we should consider such a rare disease. If we can make an early, accurate diagnosis in cases showing palsy in only a few nerves, then we would not encounter Garcin syndrome because Garcin syndrome is an advanced type of metastasis from a variety of primary cancers to the cranial nerves.

In conclusion, the first manifestation of lung cancer may potentially be the onset of cranial nerve palsy. Therefore, we should make an accurate diagnosis in such cases before Garcin syndrome develops.

## ACKNOWLEDGMENTS

*The authors thank Dr. Brian Quinn of Kyushu University for his critical reading of this manuscript.*

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